

Date	Period	Class	Date	Period	Class

Subject Matter:

lesson (1)

Adaption and survive

Aims: by the end of the lesson the student should be able to :

- 1) Identify the problems affect survival of organisms
- 2) *Identify the structure and function of the adaptation
- 3) *define the adaptation
- 4) *to keep animals

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation:

Some problems affect survival of organisms

Such as high or low temperature or water scarcity or water abundant

Animals and plants adapt to environmental changes in order to survive

1-Adaptation of Bats

Some people think that a bat is a scary creature, but a bat is a useful creature for humans and other creatures

1-Bats sleep with their head upside down

2-Its body structure allows it to fly like a bird

3- The bat feeds on insects and mosquitoes

4- Bats are like bees and butterflies help flowers (in transferring pollen grains)

- 5- The bat is a nocturnal animal that is most active at night to hunt insect easy
- 6- The bat can't see well
- 7- The bat moves depends on the method of eco location
- Echolocation : sound waves back when they meet object allowing the bat to see with sound
- 8- Bats release sound waves , back when they meet insects allow bat to see with sound
- 9-Bats sleep upside down to take off in flight easy
- 10-Bats have long arms and light bone to fly
- 11-They have special mouth to eat insects

Hw

Choose

- 1 - the problems which affect the survival of organism.....
- | | |
|-----------------------------|-----------------------------------|
| a - High or low temperature | b- Scarcity or abundance of water |
| c- lack of food | d- all of them |
- 2 - Bats sleep in position
- | | |
|---------------|-------------|
| a-upside down | b-sitting |
| c- inclined | d-no answer |
- 3- bats move depending on the method of.....
- | | |
|-------------|-----------------|
| a- heat | b- echolocation |
| c- snuffing | d- overhearing |
- 4- Bats are active
- | | |
|---------------------|-------------------|
| a - in the morning | b- at night |
| c- in the afternoon | d- in the evening |
- 5- Desert lizards keep their bodies cool by.....
- | | |
|-----------------|-------------|
| a- using shadow | b - running |
| c- hiding | d- sleeping |
- 6 - characteristics that help organisms survive and reproduce is.....
- | | |
|----------------|------------|
| a- hibernation | b- balance |
| c- adaptation | d-likenes |

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lesson (1)

Adaption and survive2

Aims: by the end of the lesson the student should be able to :

- 1) Identify the problems affect survival of organisms
- 2) *Identify the structure and function of the adaptation
- 3) *define the adaptation
- 4) *to keep animals

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation:

2- desert lizards

In the hot times

it keeps body cool by shadow

3- penguin feet

Climate is one of the reasons for adaptation over time

How do penguins bear walking on snow?

Penguins keep their feet warm due to the circulation of blood within the blood vessels in the feet

The vessels carry the cold blood from the feet, and the other vessels carry the hot blood from the parts of the body covered with fur.

The blood vessels that carry cold blood wrap around the vessels that carry hot blood, which leads to the transfer of heat to the cold feet.

Penguin have structural adaptation :

1-they have feathers to keep warm

2-paddle like flippers for swimming

3-blubber (fats) to keep warm

4-Adapt to survive (ways of adaptation)

it is the characteristics that help living things survive and reproduce in an ecosystem

examples **The polar bear** : is distinguished by it has

white fur that helps it to hide among snow while hunting

The brown bear : It is distinguished by its dark fur, which helps it to hide among the trees while hunting

Caracal A carnivorous mammal animal it has golden fur to hide in the desert

fennec fox A small fox that lives in the desert . it has big ears It has golden fur to hide in the desert

Lizards they have colored scales that help them hide among the colored rocks in the desert to hide from predators or to sneak up to preys

HW

7 - penguins live in

- a- the desert
- b- Antarctica
- c- rivers
- d- Savannah forests

8- one of the reasons that the living organisms adapted

- a - climate
- b- forests fires
- c- earthquakes
- d - pollutions

9- The feet of penguins stay warm.....

- a - standing along time on the rocks
- b- his feet have feathers
- c- the blood vessels carry the cold blood from the feet
- 4- a and c

10 - fennec fox has golden fur to

- a - run fast in the desert
- b- to warm
- c- Hide in the desert
- d - No answer help them Hide in the desert

11 - desert lizards have.....

- a- big ears
- b- colored scales
- c- wings
- d- white fur

12- camel can adapt in the desert because it has

- a- thick white fur
- b - hump and flat feet
- c-brown fur
- d- big ears

Date	Period	Class	Date	Period	Class

Subject Matter:

lesson (1)

Types of adaptation

Aims: by the end of the lesson the student should be able to :

- 1) Identify the problems affect survival of organisms
- 2) *Identify the structure and function of the adaptation
- 3) *define the adaptation
- 4) *to keep animals

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation:

Types of adaptation	
Behavioral It is the change that occurs to a group of animal	Structural Take place inside the body of organisms

Adaptation of fennec fox and polar fox

fennec fox	Arctic fox
1-Lives in a dry desert climate 2-It has golden fur, which helps it to hide in desert and protect it from sun 3- He depend on panting like dogs to cool his body 4-it has big ears to cool his body 5-they eat insects ,fruits ,remains of preys and plants	1-Live in tundra desert 2-It has white fur that helps it to hide among the snow while hunting 3- small Ears and short legs help him to keep warm 4- they eat insects ,fruits ,remains of preys and plants

Notes

The bull shark has the ability to live in fresh and salt water
It uses a hiding strategy called color contrast

Examples of animal adaptation to the environment

It is cold-blooded animal To adapt to the environment

Hw

6- kapok Trees is in savannah fore in Barzil ()

Date	Period	Class	Date	Period	Class

Subject Matter:

lesson (1)

Types of adaptation2

Aims: by the end of the lesson the student should be able to :

- 1) Identify the problems affect survival of organisms
- 2) *Identify the structure and function of the adaptation
- 3) *define the adaptation of some plants
- 4) *to keep plants

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation:

adaptation of plants The big trees

There are savannas in South Africa

Where is the moderate temperature?

But there is a severe shortage of water

This is known as the dry season

Which lasts half a year. Most of the trees cannot tolerate this drought

Except the umbrella acacia tree

Adaptation of umbrella acacia plant

Ways of adaptation	How adaptation help plant
1 –small leaves at the top of trees 2- wedge root reach to 35 meter 3-trunk 4-extreme altitude 5-Spins around leaves 6-Leaves secret poison	1-work as umbrella and absorb sun light to make food 2- fix tree and absorb underground water 3- store water 4-to prevent animals to reach it 5-to prevent animals to eat it 6- to prevent animals to eat it because it has bad taste

Notes

The acacia tree sends bad smelling warning messages to the surrounding trees to begin producing the same poisonous substance.

Kapok tree

Live in Amazon rainy forest in Brazil

Its height is 70 meter

Ways of adaptation	How adaptation help plant
1 -leaves looks like palm of hand 2 -Spread the fragrance of her flowers 3-it has strong roots	1-To allow wind to move between them 2- to attract bats To carry pollen grain 3- to fix tree in the soil

Adaptation of some plants

Plant	Adaptation	Reason
Mangrove ¹	Long root	To resist water waves
Louts	Strong stem	To resist water waves
Palm ¹	Strong stem	To resist wind
Pine ¹	Leaves change to spins	To prevent animals to eat it
Opuntia ¹	Leaves change to spins	To prevent animals to eat it

HW

put (V) or (x) in the following sentences

7- Structural adaptation is a change in the behavior of animals

8 - kapok leaves reticulated veins similar to the palm of the hand

9 - Bull shark can live in a salty water only

10- Agama lizard and Tiger chameleon are From reptiles have cold blood

complete the sentences

1- bats depend on because they cannot see well at night

2- the brown bear is distinguished by to hide among the trees while hunting

3- camel has To walk on the hot sand

4-The feet of penguins stay warm because of

5-Desert lizards keep their bodies cool by using

6-Structural adaptation (Physical Takes place) . inside the

7- tiger chameleon has V - shaped feet that

8. It can sneak up on its prey using camouflaging strategy called

9 - The Savannah forests are found in

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Subject Matter:

The digestive system

Aims: by the end of the lesson the student should be able to :

- 1) Identify the component of Digestive system
- 2) *Identify the structure and function of the Digestive system
- 3) *define the digestion process
- 4) *to keep Digestive system healthy

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation:

1 – The digestive system

* Digestion:

The process of breaking down

complicated substances (water – Insoluble) substances

to simple (water – soluble) substances

The digestive system

Body gets Nutrients from food which give him energy to move or to speak

Body need energy to do its functions like pulse and respiration

Body has digestive system to digest food and get benefit from it

digestive system consists of some organ

digestive system consists of

1-Mouth

2- Pharynx -

3- Esophagus

4- Stomach

5- Small intestine

6- Large intestine

7-Rectum

8- Anus

1) The mouth

a- Food is chewed in the mouth by teeth

b - digestion starts in the mouth because it has

saliva

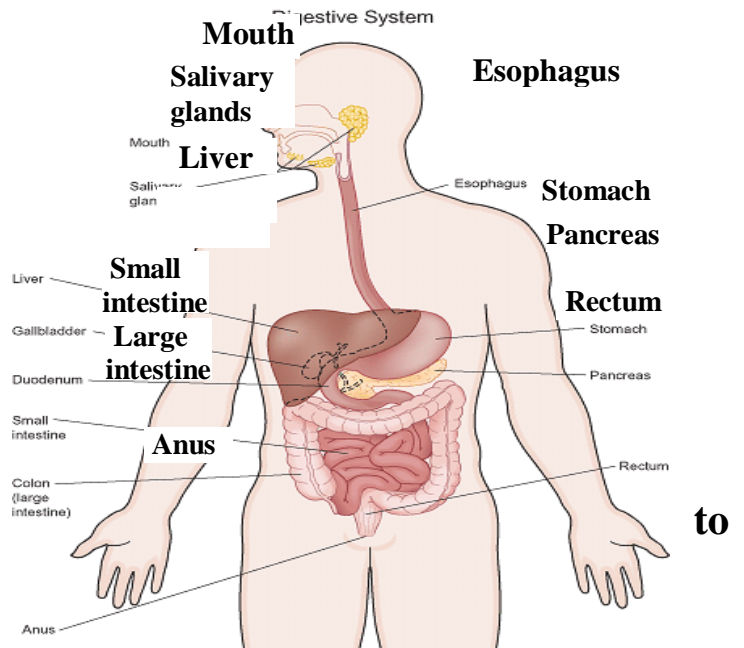
Saliva moist and fragment

The food

The teeth

it cut food to pieces and grind food ease swallowing

Tongue :- mix food with saliva



2) The pharynx:-

Common cavity leads to esophagus and trachea

3) The esophagus

Function:- a tube permits the food to pass from the pharynx to the stomach

4) - The stomach:-

It is a sac - like organ

Function:- it mix food with digestive juices

Food stay hours in stomach until it become liquid

Stomach muscles move food to a long tube called The small intestine

5 - The small intestine:-

It is a long convoluted tube (about 6 meter)

Where the liver juice and and pancreatic juice is poured

which the food is completely digested

and change to simple substance

Absorption :-

The wall of small intestine absorbs simple substance and move it to the blood

6- The large intestine

1- it absorb water from food

2-stores indigested food and wastes till they are ejected from the body through the anus

The number of heart beat is 100000 pulse in day

The number of respiration is 20000 in day

9

The digestive system in cow and dog

Cow	Dog
1-long digestive system 2- it has many stomach To adapt with eating grass because it is hard in digestion 3-the mouth has equal teeth	1-short digestive system 2- it has one stomach To adapt with eating meat 3-the mouth has sharp teeth

☞ Write scientific term:

3- Long convoluted tube digest food completely (.....)

4- Juice digest starch in mouth (.....)

☞ complete :

1) Digestive canal start with and ends with

3) Mix food with saliva

5) Chew food in mouth

6) Complete digested food and absorption takes place in

☞ Write scientific term:

2- Organ digest food completely (.....)

5- Organ store undigested food till go out juice (.....)

6- Change complicated food into simple soluble in water (.....)

7-Gland under stomach (.....)

8- Tube passes food from pharynx to stomach (.....)

Date	Period	Class	Date	Period	Class

Subject Matter:

The human respiratory system

Aims: by the end of the lesson the student should be able to :

- 1) Identify the component of respiratory system
- 2) *Identify the structure and function of the respiratory
- 3) *define the respiration process
- 4) *to keep respiratory system healthy

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation:

Respiration:-

braking down(burning)[oxidation] the food in the presence of oxygen producing heat energy, CO₂ and water vapour

[process which provide the body with oxygen needed for breaking down food in the body cell to get energy and get rid of harmful products (CO₂ and water vapour)]

respiration

digested food(sugar) + oxygen \longrightarrow heat energy + CO₂ + water vapour

*we can live without food for several days

*we can not live without oxygen for a few minutes

Respiration

Is the process in which the air rich in oxygen enter into 2 lungs and the air rich in carbon dioxide release outside

☞ Respiration give the body the energy needed to do all functions.

The Respiratory system

The system which provides animals with oxygen and takes away carbon dioxide gas

We can't store oxygen in our body

When we respire air enter in

1- nose

2- The pharynx (throat)

3- The larynx (the voice box)

4- The trachea

5- The bronchi

6- The two lungs

When air enter in the 2lungs the lungs swell

4- The trachea

- It allows inhaled air and exhaled air to pass to your lungs

Trachea is divided to bronchi which divide to small branches end with air sacs (alveoli)

5- The bronchi :-

Carry the air into the lungs

6- The two lungs

-It contains millions of tiny air sacs (alveoli) where gases are exchanged
- Oxygen diffuses into the blood .

Inhalation process	Exhalation process
Entering the air containing more oxygen to the lungs <u>Inhaled air</u> Contain more ratio of oxygen	going out the air containing carbon dioxide gas from the lungs <u>exhaled air</u> ¹ :- Contain more CO ₂ and water vapour
<u>During inhalation process:-</u> 1- diaphragm contract and <u>moves down</u> 2- The ribs <u>move up</u> 3- The rib cage (chest ¹) <u>increase</u> so the air enters the lungs.	<u>during exhalation process</u> 1 -The <u>diaphragm</u> Relaxes and moves <u>up</u> 2- the ribs <u>move down</u> 3- the rib cage (chest) decreases so the air goes out carrying CO ₂ and water vapour.

Diaphragm:-

It is a muscular membrane separate between chest cavity and abdominal cavity .

H.W

- 1- The gas exchange process takes place in the
(mouth - trachea - lungs - nose)
- 2- The responsible organ for getting oxygen gas from inhaled air is the.....
(nose - stomach - lungs - small intestine)
- 3- The responsible organ for preventing the food from entering to the respiratory system is the (nose - pharynx - larynx - epiglottis)
- 4- The important organ in inhalation and exhalation processes is the
(oesophagus - diaphragm - larynx - nose)
- 5- Gas exchange during the process of respiration occurs in the
(nose - trachea - alveoli - mouth)
- 6- Is considered as the common passage for food and air.
(Pharynx - Nose - Larynx - Mouth)
- 7- Epiglottis is found.....
(above of larynx -above of pharynx - inside the nose - beside the tongue)
- 8- Is found in the lungs and gas exchange occurs inside them.
(Trachea - Epiglottis - Alveoli - Larynx)
- 9- The is considered from parts of the respiratory system.
(mouth - nose - oesophagus - stomach)
- 10- A living organism obtains his required energy from process. (digestion - circulation - excretion - respiration)

Date	Period	Class	Date	Period	Class

Subject Matter:

respiration in fish

Aims: by the end of the lesson the student should be able to :

- 1) Identify the component of respiratory system
- 2) *Identify the structure and function of the respiratory
- 3) *define the respiration process
- 4) *to keep respiratory system healthy

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation:

respiration in fish

1-fish cant respire by lungs

2 -fish respire by gills

3-gills get oxygen from water and remove carbon dioxide gas

4-gills are found under operculum at the 2 sides of head of fish

5-water enter into mouth of fish and move to gills then get out through operculum

6-blood vessels distribute oxygen on all body parts

7-gills is from structural adaptation that help fish to respire

The similarity between respiratory system in man and fish

both of them give fish and man oxygen and get out carbon dioxide and distribute oxygen on all body parts

The difference between respiratory system in man and fish

man has lungs to get oxygen from air

fish has gills to get oxygen from air

H.W

- 11-** The gas exchange process takes place in the
(mouth - trachea - lungs - nose)
- 12-** The responsible organ for getting oxygen gas from inhaled air is the.....
(nose - stomach - lungs - small intestine)
- 13-** The responsible organ for preventing the food from entering to the respiratory system is the
(nose - pharynx - larynx - epiglottis)
- 14-** The important organ in inhalation and exhalation processes is the
(oesophagus - diaphragm - larynx - nose)
- 15-** Gas exchange during the process of respiration occurs in the
(nose - trachea - alveoli - mouth)
- 16-** Is considered as the common passage for food and air.
(Pharynx - Nose - Larynx - Mouth)
- 17-** Epiglottis is found.....
(above of larynx -above of pharynx - inside the nose - beside the tongue)
- 18-** Is found in the lungs and gas exchange occurs inside them.
(Trachea - Epiglottis - Alveoli - Larynx)
- 19-** The is considered from parts of the respiratory system.
(mouth - nose - oesophagus - stomach)
- 20-** A living organism obtains his required energy from process. (digestion - circulation - excretion - respiration)

Date	Period	Class	Date	Period	Class

Subject Matter:

The role of humans in influencing the environment

Aims: by the end of the lesson the student should be able to :

- 1) Identify the component of eco system
- 2) *Identify the structure and function of environment
- 3) To keep animals
- 4) *to keep environment clean

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

The role of humans in influencing the environment

changes in the ecosystem are

A-Natural change

- 1-Change in temperature
- 2-Amount of rain
- 3-Forest fires
- 4-Flood

All these lead to ^{الي} increase or decrease The number of animals

B-Changes due to human activities

- 1-Neglecting agriculture and leveling the land
- 2-Cutting down forests and razing the land
- 3-Filling swamps and removing sand dunes

Effects of human activities

- 1-Air pollution due to cars and factory
- 2-Water pollution due to throwing wastes .

3-When air and water and soil is polluted so the animal move to another place to live in to get their needs

4-Man migrate from his place to another place because he is affected by pollution

4- Pollution damage lungs and cause Asthma

The relation between functions and adaptation

Save the amphibians in Panama

Amphibians such as frog,

1-It lives in a sandy environment and needs water

2-She breathes through the lungs and skin,

3-she has moist skin that allows oxygen to pass into her body

4- Pollution causes the death and extinction of amphibians,

5- scientists turn to saving amphibians

6- 90 species of amphibians and 124 other species of animals have become extinct in the past 20 years

7-Therefore, scientists are trying to find out the reasons for this extinction to help animals survive in their environment

HW

put (V) or (x) in the following sentences

7- Structural adaptation is a change in the behavior of animals

8 - kapok leaves reticulated veins similar to the palm of the hand

9 - Bull shark can live in a salty water only

10- Agama lizard and Tiger chameleon are From reptiles have cold blood

complete the sentences

1- bats depend on because they cannot see well at night

2- the brown bear is distinguished by to hide among the trees while hunting

3- camel has To walk on the hot sand

4-The feet of penguins stay warm because of

5-Desert lizards keep their bodies cool by using

6-Structural adaptation (Physical Takes place) . inside the

7- tiger chameleon has V - shaped feet that

8. It can sneak up on its prey using camouflaging strategy called

9 - The Savannah forests are found in

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (6) Amphibians

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

) Amphibians

Amphibians: they are small animals can live in moist environments (rainforest – stream - ponds)

Examples of amphibians: Frogs – Toads – Salamanders.

- **Amphibians** can breathe using **lungs** on land (like human)
But they can also **extract oxygen from water** using **skin organ**. (Structural adaptation)
- **Amphibians** respire through **lungs and skin**.

The role of scientists to protect amphibians from extinction:

Factors cause extinction of amphibians:

- 1- Water and air pollution.
 - 2- Destroying natural habitat.
 - 3- Viruses in water.
- Scientists look to save amphibians like **golden frogs**.
 - **Golden frogs** from **endangered species**.

Protection of amphibians from extinction:

To protect amphibians must clean air and water as:

- 1- Avoid throwing **waste materials** in water.
- 2- Dispose of **chemicals** in a correct way to avoid water pollution.

Dolphin Super Senses

Dolphins have sharp sense of **Hearing** to hear all sound tones.

- Super senses of dolphins help them to:
Survive – search of food – protect them under water.
- **Dolphins** use a **property** known as “ **Echolocation** ” that depend on “ **Echo** ”
To locate their preys and objects in water.

- **Echo:** is reflection (bouncing off) of sound waves back from surface to its source.

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (2) Super Sensory Organs

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (2) Super Sensory Organs

Nocturnal Animals: A group of different animals that look for their preys **at night**.

- **Why animals active at night:** To look for food – To hide from preys.

• Super Sensory Adaptation of Nocturnal Animals

1- Snake Super Sensory Adaptation:

Snake is from **reptiles**.

Snake has ability of **heat sense** by special part in their face.
To locate their preys.

2- Bat Super Sensory Adaptation:

Bat is from **flying nocturnal** animals.

Bat use **Echolocation** property using **sound waves** by **hearing sense**. (Like **Dolphins**)

To locate their preys (insects) using **Echo**.

3- Owl Super Sensory Adaptation:

Owl is from **flying nocturnal** animals.

Owl has extra **eyesight and strong hearing sense**

Owl has **bowl-shaped face** can detect **distant** sounds and **quiet** movements.

The Nervous system

- The five **sense organs** are a part of nervous system.
- **Sense Organs** they include the eyes, nose, ears, tongue and skin they receive information from environment to the brain.

- Mammals as human, elephant and dog have the same nervous system.

The nervous system consists of:

- 1- **Brain**: the **main control center** of the body.
- 2- **Spinal cord**: carry messages from brain to body and from body to brain.
Spinal cord passes through the **backbone**.
- 3- **Nerves**: carry messages from brain and spinal cord to body and vice versa.
Nerves of **eyes and heart** connect directly to the brain.

Sensory organs: receive information from environment by sensory receptors.

Sensory receptors: nerves found in **sensory organs** receive information from environment.

Nerves: connect sensory organs with the brain.

Nerves: receive information from sensory organs (receptors) to the brain.

Brain can **processed** the information.

Electrical impulses: information transmitted in **nerves**.

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (3) Sensing of the Environment

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (3) Sensing of the Environment

- When touch **spines** of cactus plant. Withdraw hand fast in one second.
- When rat hears a snake. It jumps fast in one second.

Avoiding danger in humans and animals:

Nervous system: A system inside organism keeps it away from danger.

Nervous system: A system inside organism responsible for sensation.

Egyptian jerboa: is a **desert rodents** with very **large ears** (like fennec fox) and small eyes.

Egyptian jerboa Adaptation: it has **long hind legs** to help it jump long distances.

- A jerboa's **feet and toes have hair** to help it catch sand is **Structural adaptation**.
- Hopping a jerboa in **zigzag paths** to run away from danger is **Behavioral adaptation**.
- A jerboa has **large ears** use **hearing sense** it can hear snake. (like fennec fox)

How jerboa's body work together to avoid danger?

On hearing a danger the **sensory receptors** in the **ears** send message by **nerves** to the **brain** which gives **respond** to avoid danger.

Reaction Time: it is the time taken by organism's body to respond to danger (different stimuli).

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (4) Reaction time and Response

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (4) Reaction time and Response

Reaction time: is the period from sensing danger to being away from it.

- The **shorter** reaction time to a danger, the greater chance of survival.
- You can catch the things **faster** when you **see** it than you **hear** it.
As the brain **process** what you see faster than what you hear.

Response resulted from integration of **nervous system** with **body muscles**.

Response from the body to danger occurs when:

Sense organs sent a **signal** to the **brain** through **nerves**, the **brain** send a **response** to avoid danger.

Nerves links between **sense organs** and the **brain**.

- The response of **eye** nerves is **faster** than of **ear** nerves.
- Examples:
When you smell bad odour, nerves in **nose** send a signal to the **brain** to make respond.

When you touch hot object, nerves in **hand** send a signal to the **brain** to move hand away

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (5) How the Nervous System Works

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (5) How the Nervous System Works

Function of nervous system:

- 1- Collecting information **inside** and **outside** the body then send to the **brain** through **nerves**.
- 2- The brain **processed** this information and sends a **response**.

Nerves transmit information from **sensory organs** to the **brain** in form of **electric impulses**.

Role of sensory organs in processing information:

- 1- The **sensory organs** (eyes – ears – skin) **gathering information** by **sensory receptors**.
- 2- The nervous system (**nerves**) sends information from sensory organs to the brain to be processed.

Note: The components of nervous system are connected together to **nerves**

Nerves transmit information (**messages**) throughout the body parts.

Sound waves: A type of waves transmitted from ears to the brain.

Reflex action: A type of messages transmitted as **so fast**.

Examples of reflex action:

- 1- You **blink** your eyes when something comes near it.
- 2- Your **hand moves away quickly** when touch a very hot object (plant spines).

Note: Some messages are transmitted **so fast** like **Reflex action**.
Some messages are transmitted **automatically** like **signal to breathe**.

Sensory receptors are nerves receive information from the environment.

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (1) Light and Sight

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (1) Light and Sight

Nervous system send information from **sense organs** to the **brain** to process it.

Nervous system: A system that works with **eyes** for seeing objects.

The eye: is the organ of **sight**. Humans: need light to see objects.

Hunting with night vision

Night vision goggle: A tool used by **human** can depend on to **see at dark**.

Nocturnal animals: Animals have **night vision** to hunt at night **such as:**

1- Fishing cat: A **wild cat** that have **glow eyes** to hunt at night by **sight** sense.

Fishing cat has **glow eyes** because it has a **mirror-like** membrane on **back** of eyes that **bounce off (reflect)** light (**Structural Adaptation**)

2- Tarsier monkey: has **huge eyes** to hunt at night by **sight** sense.

Note: Bat is **nocturnal** animal use **sound waves** to hunt at night by **hearing** sense.
Fishing cat is **nocturnal** animal use **light energy** to hunt at night by **sight** sense.

- Cat eyes are **structural** adaptation but activation of animals at night is **behavioral** adaptation.

Sources of light: Objects that **gives off (emits)** their own light.

Examples of light sources: The sun – Electric lamps – candles – flash light – fire.

The moon and mirror not a source of light as they **reflect (bounce off)** light.

- Human can see objects that **give off** light or **reflect** light.

The eye can see when light fall on object and **bounce**

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (2) Hunting in the Dark

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (2) Hunting in the Dark

- Human needs a source of **light** to see **clearly** in the dark.

Nocturnal animals: Animals that have **strong night vision** to hunt in dark.

The difference between human eyes and nocturnal animal eyes:

Eye pupil: Opening inside eye allows light waves enter the eyes.

Human has small (narrow) eye pupil.

Nocturnal animals have **huge** and **wide** eye pupil to gather and reflect any **little** light.

Nocturnal animals use **sight** sense in **weak** light.

In complete darkness nocturnal animals use **hearing, touching, and smell sense** to hunt.

Snake: has **weak night vision** but it can hunt at night by **heat** sense.

The tarsier: from nocturnal animals – It lives in Southeast Asia.

The tarsier: A tiny monkey, its length is about 10 cm long.

The tarsier: It feeds on **insects, small lizards** or **birds**.

Structural adaptation in the tarsier:

- 1- Tarsier like **owl** as they have **huge eyes** to gather and reflect any **little** light.
- 2- Tarsier like **owl** as they **can't move** its eyes in their **sockets**.
- 3- Tarsier like **owl** as they **can turn its head** in **wide** directions (**180 degree**) to see distant and near objects.

Eye socket: It is a place in which the **eye can move inside** as in human.

Note: Chameleon eyes can see in **two opposite directions**.

- **In weak light:** dolphin use **hearing** sense while tarsier uses **sight** sense to hunt.
- We can see objects that **emit** or **reflect** light.
- There must be **light** to be able to **see** things **clearly** in **dark** places.
- To **see** objects as the light **falls** on object and **reflects** to the eye.

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (3) Light is Energy

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (3) Light is Energy

Light is the only form of energy that is needed to see the surroundings.

Light: is a visible form of energy travel as **light waves**.

To see objects (vision): light must **fall on** object and **reflected (bounce off)** into the eyes.

Nervous system has important role in vision:

as **the eyes** send information to the **brain** for **processing** to see objects.

- We can see objects **clearly** in **bright light** than **dim light**.
- We can't see objects in dark in **absence of light**.

Special eye structure of some animals:

Deers, horses, cats and dogs: use eyesight membrane called “ **Tapetum lucidum** ”

Tapetum lucidum: A **mirror-like** membrane **reflects** light make eyes **glows** at night.

Tapetum lucidum: A **thin reflective** layer at back of animal's eyes help in night vision.

Tapetum lucidum: The life-saving **structural adaptation** gives animal extra **night vision**.

How Tapetum lucidum works:

It reflects light like a mirror to allow eyes to collect more little light.

- Cats use **Tapetum lucidum** to hunt at night by **light waves** (sight sense).
- Bats use **Echolocation property** to hunt at night by **sound waves** (hearing sense).

In complete darkness animals use **hearing, touching, tasting and smell sense** to hunt.

Eye pupil: Opening inside eye allows light waves enter the eyes.

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (4) Reflection of light

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (4) Reflection of light

Interaction of light with different type materials:

Shiny and smooth materials: reflect **most** light such as **mirror and metal**.

Rough materials: reflect **small** amount of light such as **plastic, wood, cloth and paper**.

Transparent materials: reflect **very small** amount of light such as **glass**.

Light: is a form of energy travels in **straight lines**.

Light: like **sound** travel in the form of **waves**.

- We see objects as a result of the **reflected** light rays on our eyes.

Opaque objects: Objects don't allow light to pass through (**light can't pass through**).

Examples of opaque objects: plastic – wood – metal – human body.

- Things **can't be seen** through **opaque** objects.

Shadow: is formed by **opaque** objects as they absorb or reflect all light.

Transparent objects: Objects allow light to pass through (**light can pass through**).

Examples of transparent objects: air – water – glass window – lenses.

- Things **can be seen** through **transparent** objects.

Air: A **transparent** material that surrounds us and we **use it in breathing**.

Smooth surface: A type of surface that reflects light at the **same angle** as polished mirror.

Rough surface: A type of surface that reflects light in **different directions** as painted surface.

Rough surface: scatter or diffuse light.

How light help us to see?

Light waves **fall** on objects and **bounce off** to eyes.

Nerves of eye send message to the **brain** to interprets as image.

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (6) Vision defects

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (6) Vision defects

Eye pupil: Opening through which the light enters the eye.

Eye socket: It is a place in which the **eye can move inside** as in human.

Magnifying glass: A type of glass that **concentrate** light on a **single point**.

Eye lens: structure in the eye **focuses** falling light on the **back of the eye**.

- When the eye lens **doesn't** focus the light **properly** causes **vision defects (blurry vision)**.

- Vision defects as:

- 1- A person can't see **far** objects
- 2- A person can't see **near** objects
- 3- A person can't distinguish between **colors**.

Optometrist: A doctor who specialized in vision and eyesight.

Optometrist: A person who tests our **eyes lens** is **focusing properly or not**.

To correct the vision (Treatment of vision defects) by Optometrist:

- 1- Using **glasses** or **contact lenses**.
- 2- Using **laser surgery**.

Blindness: A person which **loses his sight completely**.

Note: Eye lens **collect (focus)** the light in a point while **tapetum lucidum reflects** the light.

- **Human eyes** have **lenses** to **focus** the light in a **point**.
- **Fishing cat eyes** seem to **glow** in dark as they have **tapetum lucidum** to **bounce off the light**.
- **Owl eyes** have **huge eyes** that **can't move** in their sockets.
- **Chameleon eyes** It has eyes **move in opposite directions**.

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (1) Communication and information transfer

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (1) Communication and information transfer

- Human and animals use their **senses** to gather information about the environment.
- Human and animals use **light and sound** to send and receive information.
- Human use **speaking, writing and reading** to communicate with each other.
- Both Human and animals use **sound, watching, movements and display light** to communicate.
- Animals use **Echolocation** to communicate with each other (dolphin – bat).
- Fireflies beetles: use **sight sense** to communicate with each other.
- Whales: use **hearing sense** as **songs tones** to communicate with each other.

Fireflies beetles: A type of beetles that produce **flash light** using their **wings**.

Fireflies beetles: produce a **chemical reaction** inside their bodies to allow **light up** and communicate.

Fireflies beetles: are **winged** beetles use **wings** to **flash light** to **warn off** predators or to attract a **mate** to reproduce.

A group of fireflies: can change their own **flash pattern** to communicate with other group.

- It is possible for a human to **interact** with fireflies by they can **imitate** each other.

Alphabet and written Language

- Human use **speaking, writing and reading** to communicate with each other.
- Human are **separated** from animals by their ability to communicate through **language and speech**.

<u>Ancient Egyptians</u>	<u>Babylonians (Iraq)</u>	<u>Mayans (Central America)</u>	<u>Chinese</u>
Created hieroglyphics language of 700 symbols.	Created cuneiform drawings .	Created hieroglyphs of 800 signs.	Created a paper from mulberry and bamboo plant .
Created a paper from papyrus plant .			

- Human use **speaking, writing and reading** to communicate with each other.
- Both Human and animals use **sound, watching, movements and display light** to communicate.
- Animals use **Echolocation** to communicate with each other (dolphin – bat).

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (2) Song of Whales

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (2) Song of Whales

- **Dolphins and whales:** use **sound energy** to communicate with each other.
- **Fireflies:** use **light energy** to communicate with each other.
- **Humans:** use **language** to communicate with each other.
- **Ear:** A sense organ that can detect **sound** energy.
- **Eye:** A sense organ that can detect **light** energy.

Humpback whales

Humpback whales: use **hearing sense**, they sing a wide range of **tones** and **songs** series.

Sound is described as:

- 1- **High pitched sound:** **soft** sounds such as **women voice**.
- 2- **Low pitched sound:** **rough** sounds such as **man voice**.

Humpback whales: use high or low pitched sounds according to the seasons:

In winter months	In summer months
The songs of humpback whales have high-pitched sounds	The songs of humpback whales have low-pitched sounds
High-pitched sounds travel better through cold water	Low-pitched sounds travel better through warm water
Songs of mating season.	

Transferring Information

Sense organs collect information then send it to the **brain** through **nerves** for **processing** (decodes).

Types (kinds) of information of eye sight sense

- 1- Human waving.
- 2- Man stops by seeing a red traffic light.
- 3- Using a rescue flare.
- 4- Using signal fires.
- 5- **Hikers** (travelers) use **mirrors** to attract rescue helicopters.
- 6- **Sailors** use light houses to tell where they are.

Note: Light travel very **fast** over distances.

Codes and Transferring Information

Code: Information that transformed into another **representative** form.

- **Human:** use **codes** to transmit information.
- **Forms of codes:**
 - 1- **Thumbs-up code:** A code that means that you say "Yes".
 - 2- **Thumbs-down code:** A code that means that you say "No".
 - 3- **Faces expressions** - **Red or green traffic light**
 - 4- **Language and music codes:** **sounds** form (tunes) use sense of **hearing** to communicate.
- Different languages have **different** codes.
- 5- **Writing code:** **symbols** form use sense of **sight** to communicate.

Lesson (3) Inventing a code

- **Fireflies:** use **flashing** light patterns to communicate.
- **Humans:** designed **Morse Code** system using **sound** or **light**.

Morse Code

Morse Code: A communication system developed by **Samuel Morse** in the 19th century.

Morse Code: A communication system that depend on **sound** or **light** energy.

Morse Code: A **simple** code consists of **short beeps** known as **dots** and **long beeps** known as **dashes**.

Dots: The short beeps of sound (**short flashes of light**) in Morse code.

Dashes: The long beeps of sound (**long flashes of light**) in Morse code.

Dots and dashes: represent different **letters of alphabet**.

- Using **sound** energy that depends on the sense of **hearing**.
- Using **light** energy that depends on the sense of **sight**.

To improve your code: use **simple code** - use **distinct letters**.

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (4) Animals Communicate with Movement

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (4) Animals Communicate with Movement

- **Humans and animals** use different ways to communicate as **sound – light – movement**.

Honey Bees use **movement** to communicate

Bees live in the **hive** **Ants** live in **colonies**

Bees use a **figure-eight pattern** dance and vibrate its **wings** as a **code** to find **food** and **water**.

The scout honeybee is responsible for **searching** out **food** sources.

The scout honeybee makes **one round dance** for **near** flower.

The scout honeybee makes **one waggle dance** for **far** flower.

Honey bee makes a series of **movements** and **vibrations** with **wings** for **flower location**.

Honey bee use **codes with movements** to communicate through **sight** sense.

Humans use **movements** to communicate **such as**:

Sign Language: It used by people of **special needs**. **Simple gestures.**

Communication Systems

System: It is a group of **related objects** that work together to perform a function.

Communication systems designed by **human** used to make communication easily.

Communication systems used to **send** and **receive** information.

Examples of communication systems: are **electronic devices – technology systems** such as:
cell phone – computer – TV

Communication systems depend on **signals** in their work.

Electronic devices are connected with **satellites, communication towers** and **software** to **transfer information** in correct way.

Animals don't use **technology systems** but use other systems.

Ants live in **colonies**.

- Groups of **ants** in a colony have **different** roles.

Nurse ants send **smelly** message when the amount of food decreases.

Scout ants search and **locate food**.

Solider ants are warning and protect colony from **dangers**.

Ants use **smell** sense. **Bees and fireflies** use **sight** sense.

Date	Period	Class	Date	Period	Class

Subject Matter:

Lesson (5) Technology Inspired (get benefit) by Nature

Aims: by the end of the lesson the student should be able to :

- 1)
- 2)
- 3)
- 4)

Teaching strategies:

Brain storming, aimed discovering, discussion and interview.

Learning tools : some tools of science lab.

Learning sources: The book, the internet

Presentation

Lesson (5) Technology Inspired (get benefit) by Nature

- Bats use **sound** to communicate by **hearing** sense.

Bats use **ears** for **echolocation** to make **high-pitched sound** reflected from object by **echo**.

Scientists inspired by bat **echolocation** to help **blind people**.

Scientists created a **cane** with **high-pitched sound**, the reflected **echo** make **vibrations** with person **thumb** to locate objects as **bats**.

- Special cane of blind person **similar** to bats in a **high-pitched sound**.
- Special cane of blind person **different** from bats in **has vibrations**. (bat can't make it)
- Special cane of blind person **similar** honeybees in makes vibrations.
- Bats live in **caves** (dark places)
- Bats make **high-pitched sound**, So humans can't hear it.
- Bats feed on insects and mosquitoes.

- Bats make sounds about **food** or where to get **sleep**.